Strain Hardening and Recovery in High-Temperature Deformation by Pure-Metal Mode

through two metastable phases (MS-I and MS-II) and finally to stable phases. The crystalline structure of MS-I phase agrees well with that of equilibrium phase at room temperature for the X-Y binary alloys.

Strain Hardening and Recovery in High-Temperature Deformation by Pure-Metal Mode

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Nippon Kinzoku Gakkai Shi (J. Jpn. Inst. Met.), **42** (1978), 432.

By a new method using the stress relaxation test, the coefficient of strain hardening without recovery (h) and the rate of recovery without strain hardening (r) are estimated in high-temperature deformation of fcc aluminum and bcc iron, where the internal stress is confirmed to be nearly 100% of the flow stress. Both h and r are dependent on applied stress σ and temperature T in a steady-state deformation, and are represented by $h=h_0(\sigma/E)^m \exp(-Q_h/RT)$ and $r=r_0\ (\sigma/E)^l \exp(-Q_r/RT)$, where h_0 and r_0 are constants, E is Young's modulus and $m=-0.88(-1.5)$, $l=4.3(3.2)$, $Q_h=-22(-76)$ kJ/mol, $Q_r=88(132)$ kJ/mol for aluminum(iron). During a transient state of tensile deformation in the constant strain-rate test, h and r are nearly independent of strain. The activation energy for recovery (Q_r) is found to be appreciably smaller than that of self-diffusion, and then possible roles of pipe-diffusion and strain-enhanced diffusion in dynamic recovery are discussed.

The Structure of Oxygen-Adsorbed Copper Surfaces Expressed as an "Oxygen Pressure-Temperature Diagram"

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Nippon Kinzoku Gakkai Shi (J. Jpn. Inst. Met.), **42** (1978), 682.

The structure of oxygen-adsorbed copper {100} and {110} surfaces has been studied by low energy electron diffraction (LEED) technique. The surface structure data obtained by the present author and other researchers are summarized in a diagram as a function of surface temperature and oxygen pressure. Attention has been given to unify the notations of the surface structures in order to facilitate comparison of the data. The diagram, called "oxygen pressure-temperature diagram", is a kind of the phase diagram for the surface, indicating the dependence of surface structure on oxygen pressure and heat treatment.

Grain Boundary Fracture of α Brass Bicrystals at an Intermediate Temperature Range

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Nippon Kinzoku Gakkai Shi (J. Jpn. Inst. Met.), **42** (1978), 1096.

Deformation and grain boundary fracture behaviours of α brass bicrystals were examined. The results are summarized as follows:

(1) The temperature dependence of the ductility of α brass bicrystals